

ACCUMULATION OF NITRITE IN ANAEROBIC WETLAND CONDITIONS

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Nitrite accumulation in soil has been observed under a variety of conditions. The phenomenon of NO_2 accumulation in soil has generally been considered due to nitrification, which requires aerobic conditions. This study presents a series of experiments of different scales, performed either in a riparian wetland in New Jersey or on the soils from the same location, that show accumulation and production of nitrite in iron reducing conditions. Porewater profiles in anaerobically kept microcosms in a greenhouse showed an increasing concentration of nitrite with depth. This experiment also demonstrated an enhanced nitrite accumulation on addition of inorganic ammonium. Peeper experiment performed in-situ in a riparian wetland affirmed the presence of nitrite under iron reducing conditions in natural conditions as well. Pushpull experiments were done with ammonium and nitrite to determine the rate of utilization of ammonium and nitrite in in-situ conditions. Thus determined rates showed consumption rates of both ammonium and nitrite to be in the same magnitude, supporting the existence of a steady state nitrite pool in such anaerobic conditions. In anaerobic batch experiment 30N_2 and 29N_2 was observed after the addition of 15N-NH_4 , indicating the oxidation of ammonium and followed by denitrification of the oxidized N-species. Overall the results show the possibility of production of nitrite in anaerobic conditions in acidic wetland soils.